DOCUMENT RESUME

ED 062 446 TM 001 614

TITLE	Bookkeeper (clerical) II 1-01.02--Technical Report on Standardization of the General Aptitude Test Battery.
INSTITUTION	Manpower Administration (DOL), Washington, D.C. U.S. Training and Employment Service.
REPORT NO	TR-S-184
PUB DATE	Oct 61
NOTE	9p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	*Aptitude Tests; *Bookkeeping; Business Skills; Clerical Occupations; *Cutting Scores; Evaluation Criteria; Job Applicants; *Job Skills; Norms; Occupational Guidance; *Personnel Evaluation; Test Reliability; Test Validity
IDENTIFIERS	GATB; *General Aptitude Test Battery

ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is also included. (AG)

ED 062446

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY

TECHNICAL REPORT

ON

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

BOOKKEEPER (clerical) II 1-01.02

B-454 or S-184

TM 001 314

U. S. Employment Service in
Cooperation with
Florida State Employment Service

U. S. DEPARTMENT OF LABOR
Bureau of Employment Security
Washington 25, D. C.

October 1961

FILMED FROM BEST AVAILABLE COPY

GATB #2240
October 1958

BOOKKEEPER II 1-01.02

B-454 or S-184

Summary

The General Aptitude Test Battery, B-1002A, was administered to a sample of 66 Bookkeeper students at business colleges in several cities in Florida. The criterion consisted of instructors' ratings based on a descriptive rating scale. On the basis of mean scores, correlations with the criterion, job analysis data, and their combined selective efficiency, Aptitudes G-Intelligence, V-Verbal Aptitude, and N-Numerical Aptitude were selected for inclusion in the test norms.

GATB Norms for Bookkeeper II 1-01.02 - B-454 or S-184

Table I shows, for B-1001 and B-1002, the minimum acceptable score for each aptitude included in the test norms for Bookkeeper II 1-01.02.

TABLE I

Minimum Acceptable Scores on B-1001 and B-1002 for B-454 or S-184

B-1001			B-1002		
Aptitude	Tests	Minimum Acceptable Aptitude Score	Aptitude	Tests	Minimum Acceptable Aptitude Score
G	CB-1-H CB-1-I CB-1-J	110	G	Part 3 Part 4 Part 6	105
V	CB-1-J	90	V	Part 4	90
N	CB-1-D CB-1-I	100	N	Part 2 Part 6	95

Effectiveness of Norms

The data in Table IV indicate that 16 of the 21 poor workers, or 76 percent of them, did not achieve the minimum scores established as cutting scores on the recommended test norms. This shows that 76 percent of the poor workers would not have been hired if the recommended test norms had been used in the selection process. Moreover, 34 of the 39 workers who made qualifying test scores, or 87 percent, were good workers.

TECHNICAL REPORT

I. Purpose

This study was conducted to determine the best combination of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery for the occupation of Bookkeeper II 1-01.02

II. Sample

The GATB, B-1002A, was administered to 69 Bookkeeper students enrolled in business colleges in several cities in Florida. The name and location of each college, the number tested and the date of testing at each college are shown below.

Name and Location of College	Number Tested	Date of Testing
Somers Business College, Bradenton	31	July 1957
Bixby Business College, St. Petersburg	15	September 1957
Massey's Business College, Jacksonville	11	September 1957
Jones Business College, Jacksonville	12	September 1957

The sample of 69 students was approximately 100 percent of the total enrollment of Bookkeeper students at these schools. Three students were eliminated from the sample: two had less than an eighth grade education and one had a lame hand. The final sample consisted of 66 Bookkeeper students (56 males and 10 females).

Most of the business colleges preferred high school graduates but did not adhere strictly to this policy.

The colleges are set up for a normal two-year, full-time bookkeeping course. Another additional full year course is offered for those who desire to go into advanced bookkeeping. A student can go through the course either faster or slower depending on his own initiative or limitations. Students can be part-time students taking courses in the mornings, afternoons, or evenings. They may take one subject at a time or actually take more than a normal full schedule if they can do satisfactory work. The course attendance obtained for this study was based on an equivalent full-time school schedule as determined by the college officials. Hence, a person attending the college half-time for three years would be given a year and a half, or 18 months attendance time. The students used in this sample had varying amounts of Bookkeeping training at the time they were rated.

Table II shows the means, standard deviations, ranges, and Pearson product-moment correlations with the criterion for age, education, and experience.

TABLE II

Means (M), Standard Deviations (σ), Ranges, and Pearson Product-Moment Correlations with the Criterion (r) for Age, Education and Experience

N = 66

	M	σ	Range	r
Age (years)	32.8	11.1	17-56	.054
Education (years)	11.9	1.3	8-14	.118
Course Attendance (months)	12.7	10.3	1-36	-.230

There is no significant correlation with the criterion for age, education or course attendance. The data in Table II indicate that this sample is suitable for test development purposes.

III. Job Description

Job Title: Bookkeeper II 1-01.02

Job Summary: Keeps complete and systematic set of records of business transactions of establishment, examining and recording transactions in record books and on forms. Balances books and compiles reports at regular intervals to show receipts, expenditures, accounts payable, accounts receivable, profit or loss, and many other items pertinent to the operation of a business. Calculates wages of employees from plant records or time cards, and makes up checks or draws cash from bank for payment of wages. Prepares, types, and mails monthly statements to customers. Performs other duties, such as taking telephone orders and making bank deposits. Operates adding machine or calculating machine. May take and transcribe dictation.

Bookkeeping courses offered at the colleges include the following:

Adding Machines	Corporations
Banking Procedure	Income Tax Records
Bookkeeping Theory	Individual Proprietorship
Business Bookkeeping Machines	Manufacturing Bookkeeping
Business Organization	Mimeograph
Business Procedure	Partnership
Calculating Machines	Social Security Records

Other related courses are offered to round out Bookkeepers. Examples of these are:

Business Law	Filing and Indexing
Business Management	Office Practice
Business Mathematics	Spelling and Vocabulary Building

The courses in all colleges are designed to produce fully trained Bookkeepers who could efficiently handle a complete set of books. The advanced courses are for students who might go on to become accountants or auditors.

IV. Experimental Battery

All the tests of the GATB, B-1002A, were administered to the sample group.

V. Criterion

The criterion for this study consisted of instructors' ratings made on a descriptive rating scale designed for Bookkeepers. Ratings were made in July - October 1958 by instructors who knew each student well. The scale consisted of eight ratable traits with possible scores ranging from 1 to 5 for each item. In three of the schools, each student tested was rated by two different instructors. At Somers Business College, each student was rated twice by the same instructor with a two week interval between the ratings. The initial ratings made by instructors at Somers Business College were added to the distribution of ratings made by one group of instructors at the other three schools, and the reratings made at Somers were added to the distribution of ratings made by the second group of instructors at the other three schools to obtain two sets of ratings for the sample of 66 students. A correlation coefficient of .82 was obtained between the two sets

of ratings. Application of the Spearman-Brown Prophecy formula raised that correlation coefficient to .90 for the combination of the two sets of ratings. The sum of the two sets of ratings was used as the final criterion for validation purposes. The possible range of criterion scores was 16 to 80. The actual range was 30 to 80 with a mean score of 58.3 and a standard deviation of 11.7.

An attempt was made to use course grades as a basis for the criterion. However, it was found that there were inconsistencies in the grading systems among the schools.

VI. Qualitative and Quantitative Analyses

A. Qualitative Analysis:

The job analysis indicated that the following aptitudes measured by the GATB appear to be important for this occupation.

Intelligence (G) - required to learn and understand the principles of bookkeeping in course work and to perform the various duties of bookkeeping.

Numerical Aptitude (N) - required to understand basic mathematical principles and to apply them to bookkeeping problems in course work and on the job. Also necessary for the computational work required in the job.

Clerical Perception (Q) - required to identify verbal and numerical discrepancies in reports, records, tables, etc., and to avoid perceptual errors in computations and transcription in course work and on the job.

Finger Dexterity (F) - required for performing various machine operations.

On the basis of the job analysis data, the following aptitudes are considered obviously unimportant for performing the duties of this job and are considered "irrelevant" aptitudes: S-Spatial Aptitude and P-Form Perception.

B. Quantitative Analysis:

Table III shows the means, standard deviations, and Pearson product-moment correlations with the criterion for the aptitudes

of the GATB. The means and standard deviations of the aptitudes are comparable to general population norms with a mean of 100 and a standard deviation of 20.

TABLE III

Means (M), Standard Deviations (σ), and Pearson Product-Moment Correlations with the Criterion (r) for the Aptitudes of the GATB

N = 66

Aptitudes	M	σ	r
G-Intelligence	110.1	16.3	.523**
V-Verbal Aptitude	106.1	16.1	.506**
N-Numerical Aptitude	112.1	15.2	.374**
S-Spatial Aptitude	103.4	20.3	.384**
P-Form Perception	103.7	17.8	.395**
Q-Clerical Perception	110.7	17.7	.395**
K-Motor Coordination	103.3	21.2	.384**
F-Finger Dexterity	100.1	21.6	.356**
M-Manual Dexterity	105.1	20.6	.355**

**Significant at the .01 level

Aptitudes G, N and Q have the highest mean scores. None of the aptitudes has a standard deviation that is below 15.

For a sample of 66 cases, correlations of .316 and .243 are significant at the .01 level and the .05 level of confidence, respectively. All of the aptitudes correlate significantly with the criterion at the .01 level.

C. Selection of Test Norms

TABLE IV

Summary of Qualitative and Quantitative Data

Type of Evidence	Aptitudes								
	G	V	N	S	P	Q	K	F	M
Job Analysis Data									
Important	X		X			X		X	
Irrelevant				X	X				
Relatively High Mean	X		X			X			
Relatively Low Sigma									
Significant Correlation with Criterion	X	X	X	X	X	X	X	X	X
Aptitudes to be Considered for Trial Norms	G	V	N			Q	K	F	M

Trial norms consisting of various combinations of three and four of Aptitudes G, V, N, Q, K, F and M with appropriate cutting scores were evaluated against the criterion by means of the tetrachoric correlation technique. A comparison of the results showed that B-1002 norms consisting of G-105, V-90 and N-95 had the best selective efficiency.

VII. Validity of Norms

The validity of the norms was determined by computing a tetrachoric correlation coefficient between the test norms and the criterion and applying the Chi Square test. The criterion was dichotomized by placing as close as possible to one-third of the sample in the low criterion group. A criterion critical score of 53 was used and resulted in 21 of the workers, or 31 percent of the sample, being placed in the low criterion group.

Table V shows the relationship between test norms consisting of Aptitudes G, V and N with critical scores of 105, 90 and 95 respectively, and the dichotomized criterion for Bookkeeper II 1-01.02. Students in the high criterion group have been designated as "good students" and those in the low criterion group as "poor students."

TABLE V

Validity of Test Norms for Bookkeeper II 1-01.02
(G-105, V-90, N-95)

N = 66

	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	11	34	45
Poor Workers	16	5	21
Total	27	39	66

$r_{tet} = .73$ $\quad \chi^2 = 13.792$
$\sigma r_{tet} = .20$ $\quad P/2 < .0005$

The data in the above table indicate a significant relationship between the test norms and the criterion for the sample.

VIII. Conclusions

On the basis of the results of this study, Aptitudes G, V and N with minimum scores of 105, 90 and 95 respectively, have been established as B-1002 norms for the occupation of Bookkeeper II 1-01.02. The equivalent B-1001 norms consist of G-110, V-90, N-100.

IX. Determination of Occupational Aptitude Pattern

The specific norms established for this study did not meet the requirements for allocation to any of the existing 35 occupational aptitude patterns. The data for this sample will be considered for future groupings of occupations in the development of new occupational aptitude patterns.